



US007033608B1

(12) **United States Patent**
Jevanthi et al.

(10) **Patent No.:** **US 7,033,608 B1**
(45) **Date of Patent:** ***Apr. 25, 2006**

(54) **"BURST-FREE" SUSTAINED RELEASE
POLY-(LACTIDE/GLYCOLIDE)
MICROSPHERES**

(75) Inventors: **Ramasubbu Jevanthi**, Columbia, MD (US); **John E. Van Hamont**, Fort Meade, MD (US); **Phil Friden**, Bedford, MA (US); **Robert H. Reid**, Fairfield, PA (US); **F. Donald Roberts**, Dover, MA (US); **Charles E. McQueen**, Olney, MD (US); **Jean A. Setterstrom**, Silver Spring, MD (US)

(73) Assignee: **The United States of America as represented by the Secretary of the Army**, Washington, DC (US)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154 (a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/337,945**

(22) Filed: **Jun. 22, 1999**

Related U.S. Application Data

(63) Continuation of application No. 08/590,973, filed on Jan. 24, 1996, now abandoned, which is a continuation-in-part of application No. 08/446,149, filed on May 22, 1995, now abandoned.

(51) **Int. Cl.**
A61K 9/14 (2006.01)
A61K 9/16 (2006.01)
A61K 9/50 (2006.01)

(52) **U.S. Cl.** **424/490; 424/489; 424/491; 424/493; 424/496; 424/501**

(58) **Field of Classification Search** **424/489, 424/490, 491, 493, 496, 501**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,540,444 A	11/1970	Moreland	128/173
3,773,919 A	11/1973	Boswell	424/19
3,788,315 A	1/1974	Laurens	128/173 H

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0052510 B2 10/1994

(Continued)

OTHER PUBLICATIONS

Gilding, Biodegradable polymers for use in surgery-polyglycolic/poly (ac c acid) homo- and copolymers: 1, Polymer, vol. 20, Dec. 1979, pp. 1459-1464.

(Continued)

Primary Examiner—Thurman K. Page

Assistant Examiner—S. Tran

(74) *Attorney, Agent, or Firm*—Elizabeth Arwine

(57) **ABSTRACT**

Novel burst-free, sustained release biocompatible and biodegradable microcapsules which can be programmed to release their active core for variable durations ranging from 1–100 days in an aqueous physiological environment. The microcapsules are comprised of a core of polypeptide or other biologically active agent encapsulated in a matrix of poly (lactide/glycolide) copolymer as a blend of uncapped (free carboxyl end group) and end-capped forms ranging in ratios from 100/0 to 1/99.

4 Claims, 8 Drawing Sheets

Sheet1 Chart 1

